

SEQUENCE LISTING

<151> 1999-06-01

<160> 17

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<170> PatentIn Ver. 2.0

<210> 1

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<212> PRT

<213> *Salmonella typhimurium*

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Met Leu Ile Ser Asn Val Gly Ile Asn Pro Ala Ala Tyr Leu Asn Asn

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His Ser Val Glu Asn Ser Ser Gln Thr Ala Ser Gln Ser Val Ser Ala

20 25 30

20

Lys Asp Ile Leu Asn Ser Ile Gly Ile Ser Ser Ser Lys Val Ser Asp

35 40 45

Leu Gly Leu Ser Pro Thr Leu Ser Ala Pro Ala Pro Gly Val Leu Thr

50 55 60

25

Gln Thr Pro Gly Thr Ile Thr Ser Ser Leu Lys Ala Ser Ile Gln Asn

65 70 75 80

30

Thr Asp Met Asn Gln Asp Leu Asn Ala Leu Ala Asn Asn Val Thr Thr

85 90 95

Lys Ala Asn Glu Val Val Gln Thr Gln Leu Arg Glu Gln Gln Ala Glu

100 105 110

35

Val Gly Lys Phe Phe Asp Ile Ser Gly Met Ser Ser Ser Ala Val Ala

115 120 125

Leu Leu Ala Ala Ala Asn Thr Leu Met Leu Thr Leu Asn Gln Ala Asp

130 135 140

40

Ser Lys Leu Ser Gly Lys Leu Ser Leu Val Ser Phe Asp Ala Ala Lys

145 150 155 160

Thr Thr Ala Ser Ser Met Met Arg Glu Gly Met Asn Ala Leu Ser Gly
165 170 175

Ser Ile Ser Gln Ser Ala Leu Gln Leu Gly Ile Thr Gly Val Gly Ala
5 180 185 190

Lys Leu Glu Tyr Lys Gly Leu Gln Asn Glu Arg Gly Ala Leu Lys His
195 200 205

10 Asn Ala Ala Lys Ile Asp Lys Leu Thr Thr Glu Ser His Ser Ile Lys
210 215 220

Asn Val Leu Asn Gly Gln Asn Ser Val Lys Leu Gly Ala Glu Gly Val
225 230 235 240

15 Asp Ser Leu Lys Ser Leu Asn Ile Arg Lys Pro Val Pro Met Arg Arg
245 250 255

Lys Ile Leu Met Met Arg Arg Leu Asn Leu Met Pro Glu Pro Ala Pro
20 260 265 270

Arg Lys Val Trp Val Leu Lys Thr Val Ile Asn Lys Val Ser Leu Asn
275 280 285

25 Ile Tyr Ile Leu Ser Lys Arg Leu Glu Ser Val Glu Ser Asp Ile Arg
290 295 300

Leu Glu Gln Asn Tyr Met Asp Ile Thr Arg Ile Asp Ser Ala Gln Asp
305 310 315 320

30 Ala Asp Asp Gly Arg Ser Asp Tyr Glu Glu Leu Gly His Gly Arg Trp
325 330 335

Tyr Cys Arg Gly Val Arg Ala Val Arg Arg Tyr Ser Gly Asn Val Ser
35 340 345 350

Glu Gln Gln Ile Ser Gln Val Asn Asn Arg Val Ala Ser Thr Ala Ser
355 360 365

40 Asp Glu Ala Arg Glu Ser Ser Arg Lys Ser Thr Ser Leu Ile Gln Glu
370 375 380

Met Leu Lys Thr Met Glu Ser Ile Asn Gln Ser Lys Ala Ser Ala Leu
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Ala Ala Ile Ala Gly Asn Ile Arg Ala
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 <213> *Shigella flexneri*

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15 Glu Asn Val Met Glu Ile Gln Asn Thr Lys Pro Thr Gln Thr Leu Tyr
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20 Thr Asp Ile Ser Thr Lys Gln Thr Gln Ser Ser Ser Glu Thr Gln Lys
20 35 40 45

25 Ser Gln Asn Tyr Gln Gln Ile Ala Ala His Ile Pro Leu Asn Val Gly
25 50 55 60

30 Lys Asn Pro Val Leu Thr Thr Leu Asn Asp Asp Gln Leu Leu Lys
30 65 70 75 80

35 Leu Ser Glu Gln Val Gln His Asp Ser Glu Ile Ile Ala Arg Leu Thr
35 85 90 95

40 Asp Lys Lys Met Lys Asp Leu Ser Glu Met Ser His Thr Leu Thr Pro
40 100 105 110

45 Glu Asn Thr Leu Asp Ile Ser Ser Leu Ser Ser Asn Ala Val Ser Leu
45 115 120 125

50 Ile Ile Ser Val Ala Val Leu Leu Ser Ala Leu Arg Thr Ala Glu Thr
50 130 135 140

55 Lys Leu Gly Ser Gln Leu Ser Leu Ile Ala Phe Asp Ala Thr Lys Ser
55 145 150 155 160

60 Ala Ala Glu Asn Ile Val Arg Gln Gly Leu Ala Ala Leu Ser Ser Ser
60 165 170 175

65 Ile Thr Gly Ala Val Thr Gln Val Gly Ile Thr Gly Ile Gly Ala Lys
65 180 185 190

Lys Thr His Ser Gly Ile Ser Asp Gln Lys Gly Ala Leu Arg Lys Asn
195 200 205

Leu Ala Thr Ala Gln Ser Leu Glu Lys Glu Leu Ala Gly Ser Lys Leu
5 210 215 220

Gly Leu Asn Lys Gln Ile Asp Thr Asn Ile Thr Ser Pro Gln Thr Asn
225 230 235 240

10 Ser Ser Thr Lys Phe Leu Gly Lys Asn Lys Leu Ala Pro Asp Asn Ile
245 250 255

Ser Leu Ser Thr Glu His Lys Thr Ser Leu Ser Ser Pro Asp Ile Ser
260 265 270

15 Leu Gln Asp Lys Ile Asp Thr Gln Arg Arg Thr Tyr Glu Leu Asn Thr
275 280 285

Leu Ser Ala Gln Gln Lys Gln Asn Ile Gly Arg Ala Thr Met Glu Thr
20 290 295 300

Ser Ala Val Ala Gly Asn Ile Ser Thr Ser Gly Gly Arg Tyr Ala Ser
305 310 315 320

25 Ala Leu Glu Glu Glu Gln Leu Ile Ser Gln Ala Ser Ser Lys Gln
325 330 335

Ala Glu Glu Ala Ser Gln Val Ser Lys Glu Ala Ser Gln Ala Thr Asn
340 345 350

30 Gln Leu Ile Gln Lys Leu Leu Asn Ile Ile Asp Ser Ile Asn Gln Ser
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Lys Asn Ser Ala Ala Ser Gln Ile Ala Gly Asn Ile Arg Ala
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<213> Artificial Sequence

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restriction site

<400> 3
gaga 4

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<223> Description of Artificial Sequence: PCR Primer

<400> 4
gagacatatg ttatcagaggc aggttcagc 29

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20 <220>
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gagaggatcc ttaagctcga atgttaccag 30

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gagaggatcc ttaggtgtca attttatcct gc 32

5 <210> 8
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<223> Description of Artificial Sequence: PCR Primer

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gagactcgag cttgccactg ctcaatct 28

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<212> DNA

<213> Artificial Sequence

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15 <223> Description of Artificial Sequence: PCR Primer

<400> 17

gagaggatcc ttaagctcga atgttaccag 30

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532 'd PCT/US 20 APR 2001

SEQUENCE LISTING

<110> University of Kansas Center for Research
Walter Reed Army Institute for Research

<120> METHODS FOR THE PRODUCTION OF PURIFIED INVASIN PROTEIN AND USE THEREOF

<130> UOK 5320.1

<150> PCT/US99/24931

<151> 1999-10-21

<160> 17

<170> PatentIn version 3.0

<210> 1

<211> 409

<212> PRT

<213> *Salmonella typhimurium*

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1 5 10 15

His Ser Val Glu Asn Ser Ser Gln Thr Ala Ser Gln Ser Val Ser Ala
20 25 30

Lys Asp Ile Leu Asn Ser Ile Gly Ile Ser Ser Ser Lys Val Ser Asp
35 40 45

Leu Gly Leu Ser Pro Thr Leu Ser Ala Pro Ala Pro Gly Val Leu Thr
50 55 60

Gln Thr Pro Gly Thr Ile Thr Ser Ser Leu Lys Ala Ser Ile Gln Asn
65 70 75 80

Thr Asp Met Asn Gln Asp Leu Asn Ala Leu Ala Asn Asn Val Thr Thr
85 90 95

Lys Ala Asn Glu Val Val Gln Thr Gln Leu Arg Glu Gln Gln Ala Glu
100 105 110

Val Gly Lys Phe Phe Asp Ile Ser Gly Met Ser Ser Ala Val Ala
115 120 125

Leu Leu Ala Ala Ala Asn Thr Leu Met Leu Thr Leu Asn Gln Ala Asp
130 135 140

Ser Lys Leu Ser Gly Lys Leu Ser Leu Val Ser Phe Asp Ala Ala Lys
145 150 155 160

Thr Thr Ala Ser Ser Met Met Arg Glu Gly Met Asn Ala Leu Ser Gly
165 170 175

Ser Ile Ser Gln Ser Ala Leu Gln Leu Gly Ile Thr Gly Val Gly Ala

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185

190

Lys Leu Glu Tyr Lys Gly Leu Gln Asn Glu Arg Gly Ala Leu Lys His
195 200 205

Asn Ala Ala Lys Ile Asp Lys Leu Thr Thr Glu Ser His Ser Ile Lys
210 215 220

Asn Val Leu Asn Gly Gln Asn Ser Val Lys Leu Gly Ala Glu Gly Val
225 230 235 240

Asp Ser Leu Lys Ser Leu Asn Ile Arg Lys Pro Val Pro Met Arg Arg
245 250 255

Lys Ile Leu Met Met Arg Arg Leu Asn Leu Met Pro Glu Pro Ala Pro
260 265 270

Arg Lys Val Trp Val Leu Lys Thr Val Ile Asn Lys Val Ser Leu Asn
275 280 285

Ile Tyr Ile Leu Ser Lys Arg Leu Glu Ser Val Glu Ser Asp Ile Arg
290 295 300

Leu Glu Gln Asn Tyr Met Asp Ile Thr Arg Ile Asp Ser Ala Gln Asp
305 310 315 320

Ala Asp Asp Gly Arg Ser Asp Tyr Glu Glu Leu Gly His Gly Arg Trp
325 330 335

Tyr Cys Arg Gly Val Arg Ala Val Arg Arg Tyr Ser Gly Asn Val Ser
340 345 350

Glu Gln Gln Ile Ser Gln Val Asn Asn Arg Val Ala Ser Thr Ala Ser
355 360 365

Asp Glu Ala Arg Glu Ser Ser Arg Lys Ser Thr Ser Leu Ile Gln Glu
370 375 380

Met Leu Lys Thr Met Glu Ser Ile Asn Gln Ser Lys Ala Ser Ala Leu
385 390 395 400

Ala Ala Ile Ala Gly Asn Ile Arg Ala
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<213> *Shigella flexneri*

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Met Leu Gln Lys Gln Phe Cys Asn Lys Leu Leu Leu Asp Thr Asn Lys
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Glu Asn Val Met Glu Ile Gln Asn Thr Lys Pro Thr Gln Thr Leu Tyr
20 25 30

Thr Asp Ile Ser Thr Lys Gln Thr Gln Ser Ser Ser Glu Thr Gln Lys
35 40 45

Ser Gln Asn Tyr Gln Gln Ile Ala Ala His Ile Pro Leu Asn Val Gly
50 55 60

Lys Asn Pro Val Leu Thr Thr Leu Asn Asp Asp Gln Leu Leu Lys
65 70 75 80

Leu Ser Glu Gln Val Gln His Asp Ser Glu Ile Ile Ala Arg Leu Thr
85 90 95

Asp Lys Lys Met Lys Asp Leu Ser Glu Met Ser His Thr Leu Thr Pro
100 105 110

Glu Asn Thr Leu Asp Ile Ser Ser Leu Ser Ser Asn Ala Val Ser Leu
115 120 125

Ile Ile Ser Val Ala Val Leu Leu Ser Ala Leu Arg Thr Ala Glu Thr
130 135 140

Lys Leu Gly Ser Gln Leu Ser Leu Ile Ala Phe Asp Ala Thr Lys Ser
145 150 155 160

Ala Ala Glu Asn Ile Val Arg Gln Gly Leu Ala Ala Leu Ser Ser Ser
165 170 175

Ile Thr Gly Ala Val Thr Gln Val Gly Ile Thr Gly Ile Gly Ala Lys
180 185 190

Lys Thr His Ser Gly Ile Ser Asp Gln Lys Gly Ala Leu Arg Lys Asn
195 200 205

Leu Ala Thr Ala Gln Ser Leu Glu Lys Glu Leu Ala Gly Ser Lys Leu
210 215 220

Gly Leu Asn Lys Gln Ile Asp Thr Asn Ile Thr Ser Pro Gln Thr Asn
225 230 235 240

Ser Ser Thr Lys Phe Leu Gly Lys Asn Lys Leu Ala Pro Asp Asn Ile
245 250 255

Ser Leu Ser Thr Glu His Lys Thr Ser Leu Ser Ser Pro Asp Ile Ser
260 265 270

Leu Gln Asp Lys Ile Asp Thr Gln Arg Arg Thr Tyr Glu Leu Asn Thr
275 280 285

Leu Ser Ala Gln Gln Lys Gln Asn Ile Gly Arg Ala Thr Met Glu Thr
290 295 300

Ser Ala Val Ala Gly Asn Ile Ser Thr Ser Gly Gly Arg Tyr Ala Ser
305 310 315 320

Ala Leu Glu Glu Glu Gln Leu Ile Ser Gln Ala Ser Ser Lys Gln
325 330 335

Ala Glu Glu Ala Ser Gln Val Ser Lys Glu Ala Ser Gln Ala Thr Asn
340 345 350

Gln Leu Ile Gln Lys Leu Leu Asn Ile Ile Asp Ser Ile Asn Gln Ser
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Lys Asn Ser Ala Ala Ser Gln Ile Ala Gly Asn Ile Arg Ala
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09/830026

53 Sec'd PCT/TTO 20 APR 2001

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<110> University of Kansas Center for Research
Walter Reed Army Institute for Research

<120> METHODS FOR THE PRODUCTION OF PURIFIED INVASIN PROTEIN AND USE THEREOF

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<151> 1999-10-21

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<170> PatentIn version 3.0

<210> 1

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<213> *Salmonella typhimurium*

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His Ser Val Glu Asn Ser Ser Gln Thr Ala Ser Gln Ser Val Ser Ala
20 25 30

Lys Asp Ile Leu Asn Ser Ile Gly Ile Ser Ser Ser Lys Val Ser Asp
35 40 45

Leu Gly Leu Ser Pro Thr Leu Ser Ala Pro Ala Pro Gly Val Leu Thr
50 55 60

Gln Thr Pro Gly Thr Ile Thr Ser Ser Leu Lys Ala Ser Ile Gln Asn
65 70 75 80

Thr Asp Met Asn Gln Asp Leu Asn Ala Leu Ala Asn Asn Val Thr Thr
85 90 95

Lys Ala Asn Glu Val Val Gln Thr Gln Leu Arg Glu Gln Gln Ala Glu
100 105 110

Val Gly Lys Phe Phe Asp Ile Ser Gly Met Ser Ser Ala Val Ala
115 120 125

Leu Leu Ala Ala Ala Asn Thr Leu Met Leu Thr Leu Asn Gln Ala Asp
130 135 140

Ser Lys Leu Ser Gly Lys Leu Ser Leu Val Ser Phe Asp Ala Ala Lys
145 150 155 160

Thr Thr Ala Ser Ser Met Met Arg Glu Gly Met Asn Ala Leu Ser Gly
165 170 175

Ser Ile Ser Gln Ser Ala Leu Gln Leu Gly Ile Thr Gly Val Gly Ala

180

185

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Lys Leu Glu Tyr Lys Gly Leu Gln Asn Glu Arg Gly Ala Leu Lys His
195 200 205

Asn Ala Ala Lys Ile Asp Lys Leu Thr Thr Glu Ser His Ser Ile Lys
210 215 220

Asn Val Leu Asn Gly Gln Asn Ser Val Lys Leu Gly Ala Glu Gly Val
225 230 235 240

Asp Ser Leu Lys Ser Leu Asn Ile Arg Lys Pro Val Pro Met Arg Arg
245 250 255

Lys Ile Leu Met Met Arg Arg Leu Asn Leu Met Pro Glu Pro Ala Pro
260 265 270

Arg Lys Val Trp Val Leu Lys Thr Val Ile Asn Lys Val Ser Leu Asn
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Ile Tyr Ile Leu Ser Lys Arg Leu Glu Ser Val Glu Ser Asp Ile Arg
290 295 300

Leu Glu Gln Asn Tyr Met Asp Ile Thr Arg Ile Asp Ser Ala Gln Asp
305 310 315 320

Ala Asp Asp Gly Arg Ser Asp Tyr Glu Glu Leu Gly His Gly Arg Trp
325 330 335

Tyr Cys Arg Gly Val Arg Ala Val Arg Arg Tyr Ser Gly Asn Val Ser
340 345 350

Glu Gln Gln Ile Ser Gln Val Asn Asn Arg Val Ala Ser Thr Ala Ser
355 360 365

Asp Glu Ala Arg Glu Ser Ser Arg Lys Ser Thr Ser Leu Ile Gln Glu
370 375 380

Met Leu Lys Thr Met Glu Ser Ile Asn Gln Ser Lys Ala Ser Ala Leu
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Ala Ala Ile Ala Gly Asn Ile Arg Ala
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<213> *Shigella flexneri*

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Glu Asn Val Met Glu Ile Gln Asn Thr Lys Pro Thr Gln Thr Leu Tyr
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Thr Asp Ile Ser Thr Lys Gln Thr Gln Ser Ser Ser Glu Thr Gln Lys
35 40 45

Ser Gln Asn Tyr Gln Gln Ile Ala Ala His Ile Pro Leu Asn Val Gly
50 55 60

Lys Asn Pro Val Leu Thr Thr Leu Asn Asp Asp Gln Leu Leu Lys
65 70 75 80

Leu Ser Glu Gln Val Gln His Asp Ser Glu Ile Ile Ala Arg Leu Thr
85 90 95

Asp Lys Lys Met Lys Asp Leu Ser Glu Met Ser His Thr Leu Thr Pro
100 105 110

Glu Asn Thr Leu Asp Ile Ser Ser Leu Ser Ser Asn Ala Val Ser Leu
115 120 125

Ile Ile Ser Val Ala Val Leu Leu Ser Ala Leu Arg Thr Ala Glu Thr
130 135 140

Lys Leu Gly Ser Gln Leu Ser Leu Ile Ala Phe Asp Ala Thr Lys Ser
145 150 155 160

Ala Ala Glu Asn Ile Val Arg Gln Gly Leu Ala Ala Leu Ser Ser Ser
165 170 175

Ile Thr Gly Ala Val Thr Gln Val Gly Ile Thr Gly Ile Gly Ala Lys
180 185 190

Lys Thr His Ser Gly Ile Ser Asp Gln Lys Gly Ala Leu Arg Lys Asn
195 200 205

Leu Ala Thr Ala Gln Ser Leu Glu Lys Glu Leu Ala Gly Ser Lys Leu
210 215 220

Gly Leu Asn Lys Gln Ile Asp Thr Asn Ile Thr Ser Pro Gln Thr Asn
225 230 235 240

Ser Ser Thr Lys Phe Leu Gly Lys Asn Lys Leu Ala Pro Asp Asn Ile
245 250 255

Ser Leu Ser Thr Glu His Lys Thr Ser Leu Ser Ser Pro Asp Ile Ser
260 265 270

Leu Gln Asp Lys Ile Asp Thr Gln Arg Arg Thr Tyr Glu Leu Asn Thr
275 280 285

Leu Ser Ala Gln Gln Lys Gln Asn Ile Gly Arg Ala Thr Met Glu Thr
290 295 300

Ser Ala Val Ala Gly Asn Ile Ser Thr Ser Gly Gly Arg Tyr Ala Ser
305 310 315 320

Ala Leu Glu Glu Glu Gln Leu Ile Ser Gln Ala Ser Ser Lys Gln
325 330 335

Ala Glu Glu Ala Ser Gln Val Ser Lys Glu Ala Ser Gln Ala Thr Asn
340 345 350

Gln Leu Ile Gln Lys Leu Leu Asn Ile Ile Asp Ser Ile Asn Gln Ser
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Lys Asn Ser Ala Ala Ser Gln Ile Ala Gly Asn Ile Arg Ala
370 375 380

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<213> Artificial

<220>
<221> misc_feature
<222> (1)..(28)
<223> PCR Primer

<400> 16
gagactcgag cttgccactg ctcaatct

28

<210> 17
<211> 30
<212> DNA
<213> Artificial

<220>
<221> misc_feature
<222> (1)..(30)
<223> PCR Primer

<400> 17

gagaggatcc ttaagctcga atgttaccag

30